BUYER'S GUIDE: Users Want The Bare Fax *page 116*

A CAHNERS PUBLICATION

DATAMATION®

FOR CORPORATE COMPUTING PROFESSIONALS WORLDWIDE

SEPTEMBER 1, 1992

Thomas Blitz, president, Compass America Inc., has a gauge on performance

Does Your IS Shop Measure Up?

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Stress Tests For GUI Programs *page 37*

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FOR CORPORATE COMPUTING PROFESSIONALS WORLDWIDE

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Making The Best Mainframe Deal

How can you cut your large systems costs? Information is the secret to striking bargains on big-ticket hardware and software.

BY NED SNELL

The mainframe market stinks on ice. IBM and its plug-compatible manufacturer (PCM) competitors Amdahl Corp. and Hitachi Data Systems Corp. brawl like starving hyenas over scraps from the market carcass, their margins cut to marrow. A mainframe fire sale is on, or so it seems.

Weird it is, then, that even amid the carnage, many companies still pay too much for mainframe materiel. According to market researcher Xephon Technology Transfer Ltd. of Newbury, U.K., as much as 90% of buyers worldwide pay more than they have to for some mainframe models. "P.T. Barnum was right," says Jim Cassell, vice president/service director, large computer strategies, at the research firm Gartner Group Inc. in Stamford, Conn. "There are suckers out there that are paying close to list price."

The difference between the suckers and the savvy is information—on market principles and market values, and on negotiating strategies that have saved the savvy millions.

For starters, list price—for main-

Unveiling The Street Prices

Use this guide to determine what you should be paying for mainframe MIPS. Mainframe performance and market prices are projected through the year 2000. For IBM's largest mainframes, price per MIPS decreases 15% each year, while system performance (measured in number of MIPS) increases 35% every year.

Year	Street Price Per MIPS	Largest System (in MIPS)	Street Price Of Largest System	Year	Street Price Per MIPS	Largest System (in MIPS)	Street Price Of Largest System
1985	$181,000	27	$4,887,000	1993	49,321	298	14,691,424
1986	153,850	36	5,607,833	1994	41,923	402	16,858,409
1987	130,773	49	6,434,988	1995	35,634	543	19,345,024
1988	111,157	66	7,384,148	1996	30,289	733	22,198,415
1989	94,483	90	8,473,310	1997	25,746	989	25,472,682
1990	80,311	121	9,723,124	1998	21,884	1,336	29,229,902
1991	68,264	163	11,157,284	1999	18,601	1,803	33,541,313
1992	58,024	221	12,802,984	2000	15,811	2,434	38,488,657

Note: MIPS calculations have been rounded to the nearest whole number; street price calculations are based on unrounded MIPS figures.

Source: Xephon Mainframe Market Monitor

frames as for Buicks and beachhouses—means very little. For example, IBM's top-of-the-line water-cooled ES/9000 lists for $23.5 million. That box "will sell at the moment for anywhere from 18 to 12 million dollars, for identical configurations," says Barry Graham, an independent consultant to the "Mainframe Market Monitor," a newsletter and information service published by Xephon. Based on polls of its international circulation of 500 mainframe buyers, the newsletter prints the actual street prices paid for mainframe computers and peripherals, and it offers advice for making the best deal. Similar data are available from the Gartner Group. Without such information, says Graham, buyers are likely to pay too much.

After having learned the current street price per million instructions per second (MIPS) for mainframe processors, CPU buyers should chart a curve reducing that price by 15% per year and post the chart on the wall. Then MIS managers should make sure future purchases stick to that curve, advises Graham, a former executive of UNIVAC, IBM and Hitachi Data Systems. By following the 15% rule—which has reliably reflected actual selling prices since the 1970s—buyers can avoid being snowed by "discounts" whose numbers look good but still yield a selling price out of line with market value.

> "This is the worst supply/demand imbalance in the high end we've ever seen."
> ■

IBM business practices management director Art Cohen challenges such "commodity-based" pricing models, pointing out that feature distinctions, package discounts and even differences in vendor-provided services and expertise affect the actual value of a purchase and thus the price the buyer should pay. Such factors don't fit in cost-per-MIPS equations, Cohen says.

Every customer's needs are different, Cohen adds. "Some people might buy a house and pay more because it's a corner lot. . . There are so many different aspects that make each transaction so unique, that you can't get to a number that relates to the price of the product," he argues.

But even ignoring the 15% rule and starting with the vendors' list prices, clever buyers can find advantages. For example, consultant Graham says buying a secondhand mainframe model you don't want and then upgrading to the model you do want can be cheaper than buying what you want outright—even if you pay full list price for the upgrade.

For example, a secondhand IBM ES 9000 model 720 runs about $3 million, and the list price to upgrade from the 720 to the 900 is $10 million. A total of $13 million buys a new computer that lists for $23.5 million. "Any user who pays more than $13 million is frankly off his mind," says Graham. He adds that buyers don't actually have to implement that strategy; just knowing they have the option gives them a valuable bargaining chip.

A more traditional method of getting a good price is taking competitive bids from IBM and its PCMs—a tactic Graham considers essential. But Gartner's Cassell says IBM does not take all such competitions seriously.

When he was an IBM manager, he says, "salesmen would come in with their tin cup and say, 'I need extra discount,' and the first question I'd ask is, 'Has this guy ever bought a non-IBM box?' If the answer was no, I'd say, 'What makes you believe he's going to do it this time?' " To play the competitive bid card, "you have to demonstrate that you're serious," says Cassell. "You can put out competitive bids, but if you continue to award them to IBM, then IBM doesn't believe you and neither does Amdahl or Hitachi. You have to install a non-IBM product."

Michael Simmons, executive vice president at The First National Bank of Boston Corp., says no such hardball tactics are necessary if you've established a good business relationship with your supplier. Having learned the best market price from information services like Xephon or Gartner or sim-

Watch Those Software Costs!

Software license and maintenance fees now consume as much as 40% of large IS budgets, according to M. Victor Janulaitis, chief executive officer of Positive Support Review Inc. (PSR), a Los Angeles-based management-consulting firm. And Janulaitis says many big shops could save plenty by keeping a better eye on their software costs.

Janulaitis's mainframe clients have swallowed big bills lately when cash poor software vendors suddenly began invoicing for software that they had previously provided free. A more common vendor tactic is to hook customers with a big initial discount—$20,000 for software that lists for $250,000, for example—only to charge 20% of list—$50,000 per year—for maintenance after the warranty runs out. An unwary buyer might wrongly assume that maintenance was 20% of the selling price, or $4,000.

In PSR's newsletter, "PSR Review," Janulaitis writes that the key to avoiding such traps is careful software inventory management—something few shops do. He advises clients to keep accurate and complete license inventory records—even on supposedly "free" software or software bundled with hardware—and to keep a careful eye on vendors' tiered-pricing schemes, to anticipate charges at upgrade time.

"The biggest mistake that people will make is that they will upgrade a processor and just upgrade the software along with it," says Janulaitis. "It may be cheaper, depending on how the tiered pricing is done by the hardware vendor, to buy a smaller box to run this application on than paying the next increment in cost for a software license for the larger box."

ply through a peer network, you sit down with your principal supplier and say, "Look, I need your sharpest pencil, your best price," says Simmons. "If I can't get it, you force me to go to commodity-type bidding. Do you want to enter into that bidding war?"

Then, if the vendor brings back too high a price—showing he doesn't take you seriously—you take the competitive bids. That way, "They'll only do it once," says Simmons. "The neat thing about being honest with them is that if they're not honest back with you, they lose. It's a game of liar's poker where you lose if you lie."

Often, the vendor is willing to offer competitive prices without the pressure of open bidding in exchange for exclusive supplier rights for a limited term. As long as the price is right, such deals can save buyer and seller time, money and hassles.

In fact, IBM encourages such deals, offering so-called "unified pricing" arrangements to big buyers like Mobil Oil Corp. and Sears, Roebuck and Co., under which these companies commit 80 to 90% of their spending to IBM for a fixed period in exchange for roughly a 5% total discount. The PCMs have yet to respond publicly with similar deals—which would be difficult for them to make, says Cassell, since they haven't IBM's broad range of hardware (including PCs) and software to bundle. IBM's Cohen, however, says the deals don't necessarily give Big Blue an edge: "Most of our competitors can put together packages of offerings that are equivalent to ours, whether it's their own products or someone else's."

For the foreseeable future, knowledgeable buyers should be able to strike good—even amazing—deals, since the vendors are committed to selling as many units this year as last, despite tepid demand and more powerful, more costly units. "This is the worst supply/demand imbalance in the high end we've ever seen," says Cassell. That's bad for sellers, but good for buyers who arm themselves with the right information. ■

Savings Tips For Moneywise Buyers

- **Keep track of street prices through research reports and peer networking.**
- **Don't be impressed with big percentage discounts off list—the resulting selling price may still be too high.**
- **Solicit competitive bids.**
- **Don't resign yourself to paying a premium on new models.**
- **Investigate creative strategies, such as buying used equipment and then upgrading.**
- **For overseas companies buying U.S. hardware, consider buying in the States (where prices can be lower) and shipping.**
- **Delay purchases as long as possible—selling prices are falling.**
- **Bargain hard—it's a buyer's market.**

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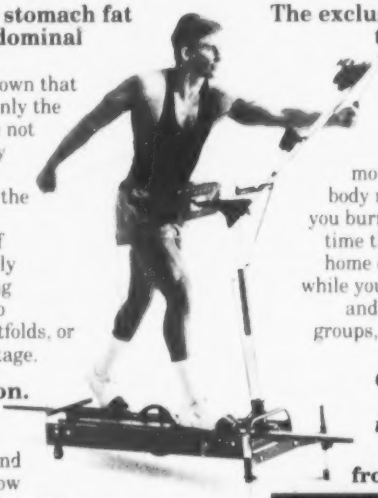

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Asia's IT Profits Tumble, Despite Revenue Rise

The bubble in Asia has burst. And IT profits have gone with it. Here's how business in a demanding economic climate.

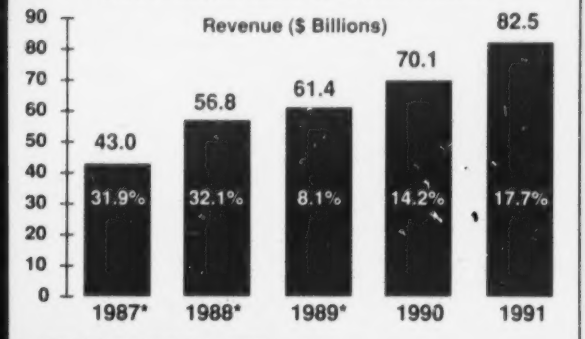
In at least one important respect, Asian business executives are a lot like their U.S. and European counterparts: when times get tough, they cut capital spending. As the recession has forced them to pore over balance sheets in search of places to cut costs, many have decided to postpone plans back on their information technology spending.

The top 25 Asian IT vendors found that out the hard way in 1991. As the worldwide recession took a firm grip on business throughout Asia, many once-thriving vendors saw their dramatically reduced earnings. Although DATAMATION's top 25 Asian information systems vendors posted revenue growth of 17.7% (in dollar terms) to $82.5 billion, earnings plummeted an estimated 38%. Earnings for the Asian IT firms dropped 46%.

In Japan, where an ever-expanding bubble economy fueled unprecedented prosperity and increases in IT spending through the 1980s, growth suddenly slowed. The country's gross national product grew by just 3.5% in fiscal 1991 compared with the 1990's 5.5% growth. Corporate and personal

Revenue On The Rise

Asia's 25 largest IT suppliers managed double-digit growth despite some poor profit returns.



* Top 25 Asian figures are estimates

BY JEFF MOAD

The DATAMATION Asian 25

ASIAN RANK 1991	1990	COMPANY	1991 IS REVENUE	1990 IS REVENUE	IS REV. % CHANGE	NATIVE CUR. % CHANGE	TOTAL REV.	IS AS % OF TOTAL	NET INCOME	FISCAL YR. END
1	1	Fujitsu	19,516.7	14,196.2	37.5%	27.7%	25,590.7	76.3%	90.8	March
2	2	NEC	16,171.0	13,404.7	20.6%	8.1%	28,052.0	57.6%	113.0	March
3	3	Hitachi	11,167.3	9,604.1	16.3%	8.0%	57,739.8	19.3%	951.7	March
4	4	Toshiba	4,996.3	5,055.9*	-1.2%	-8.2%	35,110.7	14.2%	293.6	March
5	5	Matsushita	4,769.2	4,101.8	16.3%	8.0%	55,389.6	8.6%	988.1	March
6	6	Canon	4,373.7	3,535.3*	23.7%	14.9%	13,895.3	31.5%	387.8	December
7	7	NTT Data	2,936.1	2,382.0	23.3%	14.5%	2,936.1	100.0%	37.7	March
8	8	Ricoh	2,548.4	2,331.3	9.3%	1.5%	7,564.4	33.7%	15.2	March
9	9	Nihon Unisys	2,528.1	2,241.4	12.8%	4.8%	2,528.1	100.0%	24.3	March
10	10	Oki	2,387.8	2,137.8*	11.7%	3.7%	5,065.3	47.1%	-3.6	March
11	11	Mitsubishi	2,178.4	1,830.1	19.0%	10.6%	19,412.6	11.2%	219.3	March
12	13	Seiko Epson	1,572.5	1,447.5*	8.6%	0.9%	3,494.4	45.0%	29.7	December
13	15	Nomura	861.0	832.9*	3.4%	-4.0%	1,000.4	86.1%	N/A	March
14	N/A	Samsung	835.7	800.0	4.5%	8.2%	7,127.8	11.7%	94.1	December
15	18	Sony	830.5	756.2*	9.8%	2.0%	28,413.2	2.9%	893.1	March
16	14	Acer	814.9	751.0	8.5%	8.5%**	985.2	83.0%	-22.7	December
17	16	Tatung	667.3	593.4	12.5%	12.2%	1,984.0	33.6%	18.2	December
18	17	CSK	650.9	527.2	23.5%	14.7%	669.6	97.2%	38.7	September
19	21	Intec	504.2	402.7	25.2%	16.3%	504.2	100.0%	15.7	March
20	N/A	C Itoh	484.8	416.4*	16.4%	8.0%	589.6	82.2%	N/A	March
21	23	Alps	394.1	384.1	2.6%	-4.5%	8,921.9	4.4%	N/A	March
22	20	Mitac	373.6	394.0*	-5.2%	-5.2%**	540.0	69.2%	2.0	December
23	22	Goldstar	337.6	287.2*	17.5%	21.8%	5,018.4	6.7%	25.9	December
24	N/A	Trigem	318.5	227.8	39.8%	45.0%	318.5	100.0%	3.3	December
25	24	Omron	298.6	291.3	2.5%	4.8%	3,592.9	8.3%	45.9	March

* Restated figure ** Reported in $US N/A= not available
All revenue figures are in $ millions, based on the company's fiscal year.

bankruptcies skyrocketed to their highest levels in years, and real estate and securities values plunged.

Hardest hit have been Japan's financial and retail sectors. Even among Japan's previously impervious 11 giant commercial banks, pretax profits fell by an average 14% during the last fiscal year due to bad loans and losses in securities and real estate markets.

As a result, the same financial services companies that spent heavily on information technology through the 1980s suddenly cut back. International Data Corp. Japan Ltd., for example, reports that financial industry organizations in Japan grew their overall IS budgets by only 5% in 1991. That's far short of the double-digit IS budget increases many Japanese banks and securities companies were approving in the flush 1980s. IDC, in its survey of some 1,400 user sites in Japan, also found that companies in wholesale and retail industries put a lid on IT spending even more dramatically, limiting budget increases to about 2 and 3%, respectively.

"Among many companies, information technology spending is one of the first areas of capital spending to be cut when growth slows," says Akira Suzuki, general manager of strategic planning for Mitsubishi Electric Corp.'s Information and Communication Systems group. "Many managers in Japan don't know much about IT themselves. So, if they must reduce expenses, they're likely to begin by questioning the value of IT investments."

As organizations cut their IT spending, they negotiated tougher deals. Fervent competition, which forced many vendors to cut prices in an attempt to spur orders, was responsible for most of the slower earnings growth of the vendors on DATAMATION's list.

Leading Japanese vendors have so far failed to agree on PC hardware and software standards for the domestic market.

Few vendors escaped the effects of Asia's economic slowdown. In Japan, where highly centralized user organizations have in recent years sustained growing demand for large mainframe systems at 10% per year or better, 1991 saw mainframe demand fall significantly below expectations. Although companies such as Fujitsu Ltd., Hitachi Ltd. and NEC Corp. began shipping major new upgrades to their large-scale product lines, mainframe sales languished.

Japanese mainframe demand seemed robust compared with demand in some other Asian markets, however. Mainframe orders in Australia, for example, plunged with the recession. IDC estimates that Australia's mainframe market shrank by 35% in 1991.

In such a depressed market, discounting was heavy. "We're seeing mainframe vendors offering discounts of up to 30%. And that's on top of similar discounts offered in 1991," reports Barry Dargan, head of research in the Tokyo office of the James Capel Pacific Ltd. securities firm.

The impact on the financial results of the top mainframe vendors was predictable. Fujitsu saw its net earnings in fiscal 1991 drop 85.2%. NEC's net fell 72%. And Hitachi Ltd. saw its net income drop 45%. PC makers didn't fare much better. As PC sales slowed in much of the rest of the world, they actually dropped in Japan, hurting most PC vendors, but especially domestic firms. The Japan Electronics Industry Association estimates that Japanese vendors sold 1.9 million PCs worldwide in 1991, down 7.8% from the 2.1 million that were sold in 1990. The estimated value of PCs shipped by

Japanese vendors in 1991 dropped by 3%. Of PC vendors, only Apple Computer Inc. fared well in Japan, doubling its shipments to 130,000 units, according to IDC.

Vendors blamed several factors for the 1991 slump in PC sales. Tighter IS budgets have certainly damaged PC demand. But in Japan a lack of PC standards has also taken a toll. Leading Japanese vendors such as Fujitsu and NEC, which holds more than 50% of the market, have so far failed to agree on PC hardware and software standards for the domestic market. That has delayed the arrival of important new types of PC applications that could help expand the market. Microsoft Corp.'s Windows graphical user interface is only now gaining momentum in Japan, for example, as is Novell Inc.'s NetWare network operating system. In fact, IDC estimates that only about 15.6% of PCs in Japan are networked today versus 44.2% in the United States.

A lack of PC standards in Japan also has kept prices high compared with the rest of the world. Although Japanese users have begun to see some PC price reductions already, vendors acknowledge they'll have to accelerate that trend if they hope to reinvigorate PC sales.

"In order to achieve [market share increases], I believe we have to cut down the prices of our new models even more," says Fujitsu president Tadashi Sekizawa. "So we have to make efforts to bring down our costs."

Asian PC vendors outside Japan also suffered through 1991. Although 1991 GNP and IT-spending growth in countries such as Korea and Singapore remained fairly healthy compared with Japan, vendors there faced severe pricing pressure thanks to slowing markets in the rest of the world.

"Having based their PC strategies on overseas OEM sales, a lot of the companies in Taiwan and Korea were faced with a glut of systems when worldwide markets slowed down," says Davis Blair, director of Asian research for IDC in Hong Kong. "For that reason, they started to look to their home markets to absorb that overcapacity. That led to intense pricing competition."

Such competition depressed the results of larger vendors such as Acer Inc., Hyundai Electronics Industries Co. Ltd. and Mitac International Corp. and forced several second-tier PC vendors out of the market.

Despite the current pressures facing non-Japanese Asian vendors, analysts expect the Asian market outside Japan to post steady growth in the long term. IDC Japan predicts that the portion of spending that takes place outside Japan will grow from 18% in 1990 to about 22% in 1995 or about $17 billion. Outside Japan, the fastest growing IT markets are expected to be Thailand with 23% growth between 1990 and 1995, Korea and Malaysia with 19%, Taiwan with 15% and Singapore with 14%, according to the IDC figures.

The DATAMATION Asian 25 By Technology

		1991 IS REVENUE	MAIN-FRAMES	MID-RANGES	PCs	WORK-STATIONS	SOFT-WARE	PERI-PHERALS	DATA-COM	SERVICES	MAINTE-NANCE	OTHER
1	Fujitsu	19,516.7	4,486.8	2,634.8	2,342.0	1,366.2	2,535.3	3,025.1	585.5	1,368.0	1,171.0	
2	NEC	16,171.0	3,234.2	2,096.7	4,187.8	161.7	1,933.1	2,104.1	319.7	646.8	892.2	594.8
3	Hitachi	11,167.3	3,977.7	408.9	877.3	223.0	966.5	3,345.7	446.1	408.9	297.4	215.8
4	Toshiba	4,996.3		1,301.1	2,044.6	312.3		713.8	624.5			
5	Matsushita	4,769.2			202.8	1,048.3		2,044.6	1,189.6		283.9	
6	Canon	4,373.7			612.5			3,139.0		622.2		
7	NTT Data	2,936.1							1,761.7	1,174.4		
8	Ricoh	2,548.4			408.9		126.4	609.7	1,152.4		130.0	121.0
9	Nihon Unisys	2,528.1	983.4	141.6	134.0	93.5	609.3				285.7	280.6
10	Oki	2,387.8		96.7	111.6		178.4	1,382.9	408.9		209.3	
11	Mitsubishi	2,178.4	198.3	459.6	242.4			727.2	550.9			
12	Seiko Epson	1,572.5			707.6			864.9				
13	Nomura	861.0								861.0		
14	Samsung	835.7		27.0	198.9	10.0		599.8				
15	Sony	830.5				390.0		440.5				
16	Acer	814.9	2.0	2.8	708.9	18.0	13.2	70.0				
17	Tatung	667.3		27.1	199.8	11.3		271.2	157.9			
18	CSK	650.9			108.6					542.3		
19	Intec	504.2					194.7		76.1	233.4		
20	C. Itoh	484.8		44.6		208.2	108.6	4.5	3.7		115.2	
21	Alps	394.1						394.1				
22	Mitac	373.6	10.0	6.0	235.0	15.0	3.0	79.6	20.0	5.0		
23	Goldstar	337.6		49.8	159.4	34.1	35.5	41.1			17.7	
24	Trigem	318.5			217.1	9.5	3.4	86.3			2.2	
25	Omron	298.6			146.1	29.1	14.4	106.5	2.5			

All revenue figures are in $ millions

In Japan, tight IS budgets also hammered the market for office computers, the proprietary midsized systems that in 1991 made up about 9% of the Japanese IT market, according to *Nikkei Computer*, a trade publication. The Japan Electronics Industry Association estimates that revenues from office computers were essentially flat in 1991, while the number of units shipped fell about 6%. Although some vendors, like Fujitsu, managed to grow their office computer revenues slightly, thanks to new product releases, most observers expect to see a long-term decline in the proprietary office computer market, as many users migrate to less expensive UNIX-based systems. In fact, a survey by IDC showed that users of Fujitsu and NEC office computers believe the major issue facing them is "migrating to more modern platforms."

Faced with slow-growing IS budgets in 1991, many vendors in Japan took some immediate steps to reduce their own expenses. Fujitsu, for example, decided to cut its own capital spending by one-third in 1991. Toshiba Corp., a victim of the PC price war in the States and the slumping market in Japan, elected to reduce research and development spending by 3% while also postponing plans to open new PC-manufacturing plants.

At the same time, most vendors in Japan are taking steps to keep up with, and even stimulate, what they see as fundamental, long-term shifts among their customers away from centralized, proprietary systems to distributed, client/server architectures based on standards such as UNIX and PCs.

"Just like in the U.S., business units and end users are becoming a more powerful force within Japanese companies, and the vendors are trying to cater to them with UNIX and client/server products," says Yuji Ogino, president of IDC Japan. "Vendors also see pushing these new technologies as a way to break the recession in IT spending the same way the success of 386-based PCs and micro-to-mainframe link products did in 1986/87," he adds. Although UNIX-based systems represent only about 4% of the market in Japan today, vendors such as Fujitsu, which like its competitors introduced new commercial UNIX systems last year, say they expect UNIX revenue to grow at between 20 and 30% over the next four years. However, although a significant number of Japanese users tell researchers they're interested in both downsizing and UNIX, there's very little UNIX application software in Japanese to attract users to the new platform.

Like their counterparts in the United States and Europe, Japanese vendors also plan to attack what they see as a rapidly expanding market for IS services such as consulting and systems integration. Total hardware revenue in Japan is expected to grow by 10% annually over the next four years, IDC says, but spending on software and services will grow twice as fast. Japanese IS services providers such as CSK Corp., Nomura Research Institute Ltd. and NTT Data Communications Systems Corp. all reported healthier growth in 1991 than did hardware-oriented vendors.

Companies like NTT Data, however, are seeing increased competition from hardware vendors. "Because they don't see substantial growth in their hardware business, those vendors are trying to sell services. More and more, they're competing with us," says Koji Abe, executive manager at NTT Data.

"Until now, NEC has been seen as a hardware manufacturer only. Now we're looking at things from a different perspective," says NEC senior vice president Yoshihiro Suzuki. "We want to assist our customer, and we understand that hardware is just one tool. Integration and consulting services also are important."

As Asian vendors try to fight off the effects of the recession by recasting their businesses in favor of UNIX, client/server computing and services, they face some challenges. Large hardware vendors such as Fujitsu and NEC, for example, will have to convince customers that they're not just trying to push their own hardware but that they're willing to provide top-notch service and support regardless of the platform.

While they wait for new markets and strategies to take off, Asian vendors are hoping for a quick end to the recession and a return to something close to the bubble economy of the 1980s. The Japanese government is optimistically predicting that GNP growth in fiscal 1992 will match last year's 3.5%. If that happens, vendors in Japan say customers who've been postponing buying decisions could finally begin to place orders and alleviate some of the competitive pressures among vendors. Many observers, however, believe predictions of a quick if moderate Asian recovery may be overly bullish.

"Very few people believe in the government's GNP estimates," says Capel's Dargan. "Two percent or less is probably more accurate."

If the overall confidence levels of business executives in Japan is any indication, IT vendors there will have to wait at least until next year for a recovery. Sadly, the recently published results of a closely watched Bank of Japan quarterly survey showed business executives' confidence in the economy at a five-year low. ■

Foreign Exchange

Values of foreign currency (equivalent to one U.S. dollar) used in this year's DTM100*.

Japan	¥134.5
South Korea	W733.23
Taiwan	NT26.55

* OECD average exchange rates

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Fujitsu's Sekizawa:

Dealing With Changing User Requirements

Fujitsu president Tadashi Sekizawa talks candidly about Fujitsu's attempt to become a truly global supplier in the face of a worldwide recession.

When Fujitsu Ltd.'s president and No. 1 operating executive, Tadashi Sekizawa, met recently with DATAMATION, he didn't seem the energetic reformer who, when he was named to run the company two years ago, had ambitious plans for Japan's largest mainframe vendor. Sekizawa had said that Fujitsu, much like its longtime rival IBM, needed quicker decision-making and less dependence on big iron. He began attempting to trim Fujitsu's bureaucracy and to emphasize PC and UNIX-based products while pushing the company's headline-catching globalization efforts.

In an interview at Fujitsu's Tokyo headquarters in June, however, the 61-year-old Sekizawa seemed pensive and subdued. He was quick to say his low-key attitude was the result of a slight cold, not a reaction to the worldwide recession. Still, it's clear that the economic downturn—or what's being called the bursting of the bubble economy in Japan—has left Fujitsu and its key Far Eastern IT competitors in less-than-robust health. Against this backdrop, Sekizawa discussed his explanation for the current slump among Japanese vendors; organizational changes he hopes will help Fujitsu cope with changing user requirements; and the company's ongoing efforts to become a more global IT player.

Q: *In the last year, you've been seeing changes in customer purchasing patterns. Large-systems buying has been off in particular. Do you believe we're seeing fundamental changes in user buying patterns? Or are these simply the results of short-term economic conditions?*

A: We cannot explain the change as just one or the other. Both are having an effect. For example, in the finance industry and among security brokers, orders declined by half between 1990 and 1991....The majority of the changes came from the stock market downturn. In larger industries such as [manufacturing], the orders for our largest systems have not been canceled but postponed. But we are seeing some structural changes....For example, for their branch systems, [customers] are increasingly going for UNIX systems because they think those systems are more cost-effective.

However, it is obvious that they cannot replace their mainframes with client/server UNIX systems right now because they [UNIX-based systems] lack functions such as security and other requirements. But they're starting the transition....So Fujitsu has to offer those customers a kind of road map including transition support and the best possible technologies.

Q: *Several of your larger competitors such as IBM and NEC Corp. have tried to make fundamental changes in their organizations to keep up with the structural changes taking place in the industry. What is Fujitsu doing with its organization?*

A: Of course we are considering major organizational changes to address structural changes. Some of them have already been implemented. And some of them will come later. But

my feeling is that reorganizing to only address vertical industries or along product categories [is inadequate]. We have to have both approaches. We have to have some sort of matrix organization....But we cannot implement these changes overnight.

Q: *In the last few years, Fujitsu has made several major steps to become a more global company. What are you trying to accomplish with your acquisitions of ICL PLC and other international investments?*

A: In 1989 almost 80% of our revenue was from the domestic market. It is clear that we cannot survive in the 1990s with only the domestic market. In going global, it is insufficient to try to sell products developed for the Japanese market. So we have to find partners which we can trust. That is our policy. With those partners we have to generate synergies in research and development, mutual product supply, marketing, exchange of people.

Q: *You've had some long-term experience with Amdahl Corp. Where have you made the most progress in attempting to establish these synergies?*

A: In our past relationship with Amdahl, of course the main benefit was in the sharing of research and development, manufacturing and design of large mainframes. But, for the future, even as IBM is struggling to cope with the changing industry by making alliances with small companies, I believe Amdahl must do the same. We must address those changes in the industry.

Amdahl cannot stay only in the IBM-compatible market. So I'm expecting to see some joint development synergies in software and hardware for UNIX systems. One example would be the mainframe UNIX system. Amdahl has been offering UTS on their 5990. That is a major change from their traditional MVS operating system business. Fujitsu is also offering our version of mainframe UNIX. So we are expecting to see a lot of cooperation in the UNIX software area.

Q: *As Fujitsu focuses more on the services, you'll be required to become more involved in and knowledgeable about the business issues of your customers. That means dealing with lots of cultural and local issues. Can Fujitsu or any company be a truly global provider of IS services?*

A: Of course we have to address local customer requirements. That's why we became a partner with ICL, because they know customers in the European market much better. For some time we've shared common, basic technology with ICL—the hardware—but they've been using that common technology to develop end products that meet local customer requirements. So in providing service and support we must have a partner to meet local customer needs.

But even in the area of service and support there is some basic know-how that we can share. We are actually learning how ICL provides its customers with support and service, and that will be beneficial to Fujitsu in our business. So we believe we can achieve synergies in the support and service areas also. In a country like Australia, Fujitsu had its marketing organization and ICL had its own, both addressing local customer requirements. In such countries it's logical for us to combine our strengths....So ICL Australia and Fujitsu Australia merged last year to better address local customer needs and improve our own marketing.

Q: *You've said you give your global partners such as ICL or Amdahl as much autonomy as possible. How do you avoid duplication of effort or even competition between partners while giving them autonomy? For example, your partners ICL, Amdahl and HaL Systems Corp. all seem to be developing similar reduced instruction set computing-based multiprocessor UNIX systems.*

A: I cannot disclose the future development plans of Fujitsu, ICL, Amdahl or HaL right now. But obviously we have to eliminate duplication between those companies as much as possible. For example, Fujitsu is using servers developed by ICL and, in return, Fujitsu has developed disk drives for ICL....I don't believe that HaL is developing the same product as ICL. HaL is aiming for a higher-end, more advanced product. Our plan is to eliminate duplication between our partners.

Q: *What effect has the recession had on your push to become a more global company?*

A: It's true that, because of the short-term recession, ICL's profits have dropped. But I have to point out that they are doing better than the other IT companies in Europe. But that hasn't changed our long-term objective of [achieving] mutual synergies with ICL. Nor has it [the recession] changed our strategies in Japan. Because of the recession in Japan we have seen some short-term changes in our strategy. But our [long-term] product development directions haven't been changed by the short-term recession.

Q: *Can you give us an example of short-term strategy changes that have been brought on by the recession?*

A: We in Fujitsu, of course, are cutting down our expenses to meet these tough times. In Japan this means cutting down on fixed investment for volume production. But we haven't cut down on research and development investment. And investments in the volume production facilities will be increased again when the economy improves.

Q: *You've said you expected your ICL investment would pay for itself within 10 years. Do you still expect that to be true?*

A: In fact, my expectation is that it will happen even sooner. By pursu-

ing synergies as much as possible and by saving on the resources we have to spend on development and so forth, I think we can generate revenues and profits and make money.

Q: *You've taken a personal interest in Fujitsu's PC business. How satisfied are you with the progress the company has made?*

A: On the positive side, the new product we announced last fall, FM Towns II, has been very successful. We are achieving 60 to 70% growth from the previous year. When we introduced FM Towns we were able to offer only 25 applications. Now that number has become 600. We have also made penetration into the education market....But, of course, I'm not totally satisfied with the current market share. But, if we can keep up the pace at which we are growing because of the software we have accumulated, I believe our market share will go up. In order to achieve that, I believe we have to cut down the prices of the new models even more. So we have to make efforts to bring down our costs.

Q: *Some observers have seen IBM's financial difficulties and its reorganization as an indication that Big Blue is no longer in a position to dominate the IT industry. Do you agree?*

A: I believe that it is natural that users are requiring a more and more multivendor environment. We have to satisfy their needs to integrate personal computers and workstations from other vendors. We have been doing that already. Concerning their organization, it's important to develop not only the product-oriented groups, but we also need a cross-functional group to address those integration needs. In my personal view, IBM's recent reorganization addresses the product category but not the cross-functional, customer-oriented organization element. So the customers may not be satisfied with the [IBM] reorganization. ■

IS Revenue — RANK 1 ASIA — $19.52 Billion

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A strange thing happened to Fujitsu Ltd. on its way to becoming a global information technology supplier: it was waylaid by the worldwide recession, which slowed even the largest and most successful of Japanese companies last year.

Fujitsu, Japan's leading mainframe vendor, saw many of its large systems customers—particularly those in financial and retail markets—postpone orders as they looked to cut capital spending. That led to severe price competition among Fujitsu and its mainframe competitors. And that hurt profitability.

As a result, Fujitsu's 1991 net earnings dropped by 85.2% to ¥12.21 billion ($90.8 million).

But Fujitsu's revenues from computer and other IT products actually grew by 27.7% to ¥2.63 trillion ($19.52 billion). Much of that increase, however, was attributable to Fujitsu's 80% share of ICL PLC, which the Japanese vendor acquired in 1990. Fujitsu's share of ICL's revenues, which were included in the company's full-year consolidated results for the first time in 1991, boosted Fujitsu's overseas revenues by 39.1% to nearly 30% of total revenues. The ICL acquisition, however, didn't boost profitability, as the London systems company's own earnings were down 41%.

In 1991, Fujitsu followed its ICL acquisition with several more international initiatives. Fujitsu, through ICL, acquired Nokia's data systems group, further strengthening Fujitsu's distribution channels in Western Europe and contributing to a 15.6% jump in ICL's revenues. Fujitsu also acquired its hand-held PC partner Poqet Computer Corp. and invested more than $40 million in UNIX system startup HaL Computer Systems Inc. Concurrently, Fujitsu announced its intentions to try again to market its supercomputers in the United States.

Michio Naruto, Fujitsu's senior vice president and a key architect of the company's globalization strategy, says the company would have liked to make more international acquisitions in 1991, but the recession got in the way.

At home, Fujitsu responded to the recession by cutting its own capital spending by one-third to ¥140 billion ($1.04 billion) in 1991. The company even reduced the pay of some of its top executives, a largely symbolic act. Fujitsu decided not to cut research and development spending, however.

The company's disappointing results last year weren't caused only by poor economic conditions. Fujitsu executives acknowledge that, like their U.S. and European cousins before them, Japanese IS executives seeking lower costs are beginning to consider downsizing from mainframes to UNIX-based systems and client/server architectures.

Fujitsu responded to that trend in 1991 by introducing the DS/90, a UNIX system based on reduced instruction set computing. The company also unveiled a plan called Message 90's for tightly integrating its M-Series mainframe products into multivendor networks.

Overall, Fujitsu says it expects its open-systems product revenues to grow by 31% per year between now and 1995, compared to 10% annual growth for proprietary systems.

Fujitsu also continued its push into PCs in 1991, introducing a new release of its multimedia FM Towns system as well as a pair of portables in its FMR line. The three-year-old Towns, which had not done well previously, finally showed some life in 1991, with revenues growing about 70% in a Japanese PC market that shrank overall.

Still, Fujitsu's gains in the domestic PC market are coming painfully slowly. The company's market share continues

to hover in the 13 to 14% range compared to about 50% for the market share leader, NEC Corp. The problem: Fujitsu admits that large corporations still have not bought into Towns in a big way. In fact, 90% of Towns shipments are to schools or individuals, the company says.

In the near future, Fujitsu will continue its push toward open systems, PCs, service business and global markets. Revenues from high-end mainframes, which continue to be the company's bread and butter, grew about 10% in 1990, estimates IDC Japan. That was thanks largely to the M-1800, Fujitsu's largest mainframe, which started shipping last year.

But that mainframe growth fell far short of Fujitsu's expectations. And, longer term, Fujitsu expects mainframe sales growth in Japan to slow from low double digits to between 5.5 and 7.5% annually. If an improving economy in 1992 permits those growth rates and an easing of pricing pressures, Fujitsu says it expects an 8.9% increase in revenues this year and a 227% improvement in net income.

Many experts, however, believe that little if any economic recovery will come to Japan this year and that the mainframe growth rate will be at the lower end of Fujitsu's expected range.

"If that happens, Fujitsu could be very vulnerable this year," predicts Barry Dargan, head of research for securities firm James Capel Pacific Ltd. in Tokyo.—*Jeff Moad*

When it came to sales of IS products, NEC Corp. wound up 1991 smelling like a rose compared with other Asian IS vendors. While admitting that second-half computer sales were far below original expectations, NEC officials express a confidence not heard at other companies. An unexpected gain in the company's personal-computer market share and the growing strength of its mainframe business bolstered the executives' optimistic outlook.

However, a healthy 12% growth in IS revenues to ¥2.18 trillion ($16.17 billion) contrasted grimly with total corporate sales, which increased just 2% during the fiscal year to ¥3.77 trillion ($28.10 billion). Net income suffered, plunging 72% to ¥15.2 billion ($113.0 million), reflecting 1991's weak market for semiconductors as well as the general economic downturn in the final half of the fiscal year, which ended in March 1992.

Boosting NEC's IS revenues was an improvement in market shares almost across the board. A survey of Japanese markets conducted by the *Nikkei Economic Newspaper* indicates that NEC's share expanded 2.1% in the personal computer market to 53.1% and 1.8% in the office computer market to 27.3%. The same survey also shows a 0.4% rise to 17.3% in NEC's share of the total value of domestic installed mainframe computer products.

Revenues for NEC's computer division grew 8.1% last year to ¥1.57 trillion ($11.67 billion), with an 11% rise in domestic deliveries to ¥1.45 trillion ($10.78 billion) but a 21.3% decline in exports to ¥118 billion ($877.3 million). Officials expect slower growth this year as the company feels the full impact of the recession, and they project that computer division revenues will increase only 4.4% to ¥1.64 trillion ($12.19 billion) for fiscal 1992. NEC IS revenues also include sales of factory automation and other industrial co puter systems by NEC's industrial systems division and sales of mobile faxes, G4 faxes and home banking terminals by the communications terminal division.

A 26% increase in mainframe revenues contributed substantially to the growth in NEC's total computer sales. This revenue growth derived from pent-up demand for the largest mainframes—particularly the new eight-processor ACOS 3900, introduced in October.

NEC sources say revenues from the ACOS 3900/3800/3600, its largest mainframes, were up 20%. Sales of ACOS 3300 and ACOS 3400 mainframes were flat, however, because of competition with office computers and UNIX machines. Revenue growth wasn't indicative of unit sales, which fell: Very large system shipments dropped 3% to 159 units; large system sales declined 21% to 212 units and medium-size and small systems tumbled 17% to 1,035 units. Reflecting economic conditions, NEC expects only a 5% increase in mainframe revenues for the current fiscal year, says Hiroo Shin, product planning assistant general manager.

NEC's personal computer business remained strong last year. Despite a double-digit plunge in the Japanese personal computer market, NEC increased personal computer deliveries by 2% to 1.35 million units, selling 1.31 million units for domestic use and 40,000 units headed abroad.

Maintaining growth in this market is vital, since PC sales account for 35% of NEC's total computer revenues. NEC is often the "safe buy" for Japanese MIS executives. NEC associate senior vice president Yoshi Takayama attributes the company's strength in PCs to user trust in NEC's stability and technological edge. "When the economy is tight, customers purchase products with proven reliability," he says.

NEC brought some innovative products to market last year, including a new color notebook, the 98 Note Color, which is well priced at under $4,500; the company is selling 5,000 units per month. And its existing EWS4800 workstation series was given a boost by a 6,000-unit order from

Daiwa Securities Co. Ltd. for an on-line business and information system.

But NEC's PC business, although the overwhelming market leader, faces future struggles. When asked about the threat of IBM's DOS/V open architecture, which processes both English and Japanese software, and the onslaught of low-priced IBM compatibles from Korea and Taiwan, Takayama counters that "NEC's PC-9800 series is designed for Japanese-language application users who constitute almost 95% of the Japanese market, while DOS/V products are aimed at a small international segment of the market." Yet the DOS/V challenge cannot be ignored, asserts a survey conducted by the Japan Personal Computer Software Technology Research Center, which forecasts a 14% market share for DOS/V personal computers in 1993.

Facing an increasingly tough domestic market, NEC is increasing its international reach. Control Data Corp., now Control Data Systems Inc., agreed in January 1992 to resell NEC's 25.6GFLOPS, SX-3R supercomputer series. The firms hope that Control Data can sell 20 systems over the next four years. That would be 25% of the 80 supercomputers NEC hopes to deliver—50 to Japan and 30 worldwide—by 1996.

—John Rossman

The Japanese economic downturn that started in late 1991 took a heavy toll on Hitachi Ltd.'s results for last year and threatens to have an even larger impact in the current fiscal year. Consolidated corporate revenues remained flat at ¥7.77 trillion ($57.74 billion), and net income dropped 45% to ¥128 billion ($951.7 million).

In addition to suffering big losses in the semiconductor business as prices plummeted for 4-megabyte dynamic random access memory (DRAM) chips, Hitachi was hurt by major cutbacks in computer system investments on the part of the financial industry, which analysts say accounts for 35% of Hitachi's computer revenues. And although computer revenues increased 5.6%, Hitachi expects they will fall 3.8% in the current fiscal year. "This is our most serious crisis since entering the computer business," says a top company official, who requested anonymity.

The crisis is so serious that top executives are taking pay cuts this year ranging from 10 to 15%. Hitachi has moved 2,900 of 5,000 temporarily idle workers, largely in the semiconductor and AV divisions, to more profitable parts of the company. And it has taken the drastic step of sending 60 semiconductor division employees to an unrelated company, Hino Motors Ltd., a Toyota Motor Corp. subsidiary, where they will work on the Corolla II assembly lines.

Hitachi estimates IS revenues for the 1991 fiscal year at ¥1.50 trillion ($11.17 billion), an 8% increase from the previous year. While Hitachi does not break out the profitability of IS products, it expects that the earnings contribution from its Information Systems and Electronics Division, which includes both IS products and semiconductors, will continue to decline this year as a portion of corporate operating income.

In response to its poor performance, Hitachi will attempt to grow its relatively small midrange and personal computer businesses, which together accounted in 1991 for only 20.6% of its computer revenues—in contrast to its M-Series mainframe and software, which accounted for 50% of computer revenues, analysts say.

Sales of UNIX workstations, some of which Hitachi is building with reduced instruction set computing chips from development partner Hewlett-Packard Co., increased 5% last year. The company is said to be planning a 100-MIPS HP-PA laptop.

Hitachi's partnership with IBM Japan is heating up as well. The two companies are jointly developing personal computer and multimedia products. Hitachi intends to market the Flora 3010N notebook made by IBM Japan, along with the rest of Hitachi's Flora PC series, through 2,000 of Hitachi's 9,000 consumer goods chain stores.

At the high end of its lineup, Hitachi introduced the new HITAC S-3000 supercomputer series, which achieves a maximum speed of 32GFLOPS. It expects to sell more than 100 systems over the next five years, garnering 30% of the domestic market. But Hitachi will have to work hard to achieve this goal—10 percentage points more than its current market share—since more than 30% of sales thus far have been to Hitachi group companies.

Hitachi also filled out its new M-800 mainframe series. In the process, the company cut its low-end mainframe product list from three families to one in preparation for the growing competition from office computers and workstations. Sources say mainframe revenues increased about 10% last fiscal year, even through orders fell 10% to 544 units for very large systems, 34% to 243 units for large systems and 16% to 977 units for medium and small systems.

Product introductions alone may not be enough to bolster the company's sinking fortunes. As Shozo Shigeoka, editor-in-chief of *Nikkei Computer*, says, "Orders for general-purpose computers were down considerably in the first half of 1992. If this situation continues for long, Hitachi will have to implement a serious restructuring of its computer business and investments."—*Tim Smith*

Toshiba Corp. took a square hit to its semiconductor and personal computer businesses last year, and its financial results tell the tale. While total corporate revenue inched up to ¥4.72 trillion ($35.11 billion) in the year ending March 31, 1992, net income plummeted 67% to ¥39.5 billion ($293.6 million). IS revenue dropped 8.2% to an estimated ¥672.0 billion ($5.00 billion), practically wiping out the previous year's 9.6% gain.

The culprit was PCs. Accounting for half of Toshiba's total IS revenues, PC sales plunged 23.6% to ¥275.0 billion ($2.04 billion). Sales of peripherals, too, were down, dropping 8.6% to ¥96.0 billion ($714 million).

Other areas of Toshiba's IS operations did considerably better, however. Sales of midrange systems rose 7.4% to ¥175.0 billion ($1.30 billion), and workstations surged 34.2% to ¥42.0 billion ($312.3 million). Unfortunately, workstations make up only 6.3% of Toshiba's total IS revenue, whereas PCs account for more than 40%.

Much of the damage in the PC arena occurred in the United States, where, in the face of a slow market racked with price wars, Toshiba reports its market share slipped from 20 to 14.3%. Although the company is not interested in initiating such wars, says Steven Lair, vice president of marketing at Toshiba America Information Systems Inc.'s Computer Systems Division, it is willing to meet price reductions "to demonstrate our long-term commitment to the market and our customers." Accordingly, Toshiba cut prices 16 to 24% in the first quarter of 1992. In contrast, in Japan, Toshiba's PC sales increased 2%.

In the face of tough times, the company has kept the level of its spending on research and development constant at ¥300 billion ($2.23 billion). Toshiba hopes that new products such as the T4400SXC, one of the first 486SX TFT-LCD active matrix color notebook computers, will generate sales, but does not expect any revenue growth in this area for fiscal 1992. Testuya Mizoguchi, general manager of Toshiba's personal computer and workstation division, stresses that "products that create new markets" are necessary to maintain growth.

Ties were strengthened with Sun Microsystems Inc. during the year as Toshiba announced plans to use the Solaris 2.0 operating system in both its SPARC LT laptop workstation series and 3100 personal computer series. Toshiba sold a total of 7,700 workstations (4,800 desktop units and 2,900 laptop units) for the year and expects this figure to reach 9,000 units (5,400 desktop and 3,600 laptop).

At the end of 1991, Toshiba teamed up with Sequoia Systems Inc. to jointly develop a UNIX, fault-tolerant, on-line transaction processing server based on Scalable Processor Architecture (SPARC) technology. The two companies hope to have a product ready by 1994 that achieves maximum speeds of 2.4 trillion instructions per second. Toshiba is billing this UNIX server as the centerpiece for the company's open network computer system strategy and will gradually revise the proprietary operating system of its midrange computers so that it is compatible with UNIX.—*Larry Greenberg*

Japan's electronics and computer firms are smarting from diminishing profits and intensely competitive markets at home and abroad, and Matsushita Electric Industrial Co. Ltd. is no exception. In the fiscal year through March 1992, consolidated net income fell 48.7% to ¥132.9 billion ($988.1 million), despite a 13% rise in revenues to ¥7.45 trillion ($55.39 billion). DATAMATION estimates that Matsushita's IS revenues increased 8%, to ¥641.5 billion ($4.77 billion).

However, the information systems sector continues to be a glaring weak point in the lineup of the giant electronics firm, which decided in 1964 to abandon its mainframe business and not pursue the IS market.

Trying to get back into the game, Matsushita forged ties with Sequent Computer Systems Inc. Munich-based Siemens Nixdorf Informationssysteme AG, Sun Microsystems Inc. and Tandy Corp. over the past few years. Matsushita also holds a majority share of workstation maker Solbourne Computer Inc. of Longmont, Colo. All this theoretically gives the company access to a wide range of computer hardware and technology, but the links have failed to help Matsushita make major inroads into computer markets either at home or abroad. "Nothing has worked yet," says Darrel Whitten, securities analyst at Prudential Bache Securities (Japan).

Consider the sad history of Matsushita's control of Solbourne. Matsushita poured close to $100 million into Solbourne, but the company stumbled last year due to poor management decisions exacerbated by conflicting goals and tensions between Solbourne and Matsushita, according to *Electronic Business* magazine. After failing to get a competitive workstation to market in time, Solbourne announced early this year that it would instead concentrate on network servers.

In June 1991, Matsushita started selling its own laptop workstation based on Sun's Scalable Processor Architecture, the P2100, which features a 15-inch color liquid-crystal display. The ¥3.85 million ($28,625) price

tag will preclude large sales volumes—Matsushita forecasts sales of 3,000 units in two years, saying it is a high-end machine for those who truly need a color screen in a tight space. The company intends to market the machines overseas as well through some collaboration with Solbourne that hasn't been detailed.

Despite the setbacks, Matsushita is intent on becoming a force in computers. After the company reached a technology agreement with Sun last year, Takeo Yoshikawa, manager of workstation development for Matsushita, said, "With audio-video and computer communications becoming more important today, the firm needs a strong computer division to compete in the marketplace."

Ignoring its lack of success so far from alliances, Matsushita is working on more joint ventures. It is talking to AT&T, among other firms, about joint development of a pen-based portable computer.—*Dennis Normile*

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Sales growth of 21.5% in computer peripherals and subsystems propelled Canon Inc.'s IS revenues to an estimated ¥588.0 billion ($4.37 billion) last year, up 14.9%. Overall revenue was up 8.2% to ¥1.87 trillion ($13.90 billion), but net income slipped 15.1% to ¥52.16 billion ($387.8 million), due to the strong yen and the worldwide recession.

Canon's biggest IS-related product continues to be its laser printer engine, used in its own printers as well as in those of Apple Computer Inc., Hewlett-Packard Co. and others. With about 70% of the market, laser printer engines continued to be Canon's cash cow, but Canon says the growth in peripherals last year came from bubble jet printers. Its BJ-10 series of portable printers is piggybacking on the notebook computer surge.

In addition, last year Canon released a desktop color bubble jet printer, the BJC-800/820, which is an indication of Canon's strategy of moving toward stand-alone devices that can be connected into networks. However, there's heavy competition in color printers and Canon won't dominate that market as it does the market for laser printers, according to analyst Steven W. Myers of Jardine Fleming Securities Ltd.

Canon also is getting into computer integration services through its half-owned domestic sales arm, Canon Sales Co. Canon Sales resells computers from Apple, Cray Research Inc., IBM and Next Inc. The money-spinner here has been Apple's Macintosh. In the October-December quarter of 1991, Apple unit sales in Japan jumped 40% over the previous quarter while shipments of PCs by Japan's makers declined 29%, according to the Japan Electronic Industry Development Association; Canon Sales is Apple's biggest Japan sales agent. Despite a $100 million investment in Next, Canon Sales has failed to make a dent in the market with its workstation.

Canon is taking a big gamble to move into another computer-related hardware niche—flat panel displays. Last fall it unveiled prototype ferroelectric liquid crystal displays (FLCDs), which may eventually prove easier to fabricate into large panels than conventional LCDs. However, manufacturing troubles led to postponing full-scale production to late 1993, a year later than planned. Canon also scaled back its earlier optimism—last year President Keizo Yamaji had boldly predicted, "The LCD market will balloon to ¥2 trillion by 2000, and we'll clinch half that market."

Canon forecasts group revenues of ¥2.05 trillion ($15.2 billion) in 1992, up 9.7%, but no growth in operating income, predictions that analyst Myers says are realistic.—*Dennis Normile*

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You might say that in 1991 NTT Data Communications Systems Corp. was in the right place at the wrong time.

As Asia's largest vendor of systems integration and facilities management services, the wholly owned subsidiary of Nippon Telegraph and Telephone Corp. is in a good position to cash in on one of the fastest growing IT segments in Japan. Revenue from systems integration and other IT services will grow by 18.5% per year between now and 1995, estimates International Data Corp. Japan Ltd. That's almost twice as fast as hardware revenue growth in Japan during the same period.

That shift from hardware to service and support spending helped NTT Data increase its revenue in fiscal 1991 by 14.5% to ¥394.9 billion ($2.94 billion). The increase was just shy of the 15.8% gain the company projected at the outset of 1991.

But, like many of its hardware vendor counterparts, NTT Data saw the recession in Japan take a toll on its earnings, as customers in some critical industries delayed or scaled back projects as competition intensified. NTT Data's net earnings dove 60.9% to ¥5.07 billion ($37.7 million), failing far short of the modest 4.2% increase that management had predicted for the year. It was the company's first profit

decline since NTT Data spun out from NTT four years ago.

About half of NTT Data's total revenue comes from rentals on existing systems, such as the massive funds transfer application the company has built for 4,800 banks in Japan. That steady revenue stream tends to even out the peaks and valleys in NTT Data's sales figures.

And, says Koji Abe, executive manager at NTT Data's development headquarters in Tokyo, the company suffered from a slowdown in new orders, particularly from large customers in the federal government and financial industries.

"This was clearly the result of the stagnant economy," says Abe. "Particularly in the financial markets, customers weren't canceling orders, but they have been scaling them back or stretching them out."

NTT Data's business also suffered from what Abe says was increased competition from hardware vendors. "Because the mainframe manufacturers don't expect substantial hardware growth, they have been looking to provide [IT] services in competition with us," says Abe. "That has meant lots of competition and slim margins for us."

NTT Data doesn't expect those competitive pressures to ease anytime soon. But the company does have a strategy for boosting revenue and improving profitability. For one thing, it's attempting to reduce its dependence on large financial and government contracts by working with partners to develop packaged solutions for new areas such as manufacturing, retailing and distribution.

NTT has been making some progress in broadening its customer base. In 1991, says Abe, 23% of the company's revenue came from outside the finance and government sectors. That was up from 19% a year earlier.

NTT Data is also trying to address competitive pressures by expanding outside Japan, primarily by offering services to multinational customers headquartered there. In addition, NTT Data paid $2 million last year to acquire 50% of Los Angeles-based software services company MISI International to bolster its operations in Southern California. It also opened a new office in Hong Kong, primarily to support customers moving into the People's Republic of China.

NTT Data also is trying to grow by moving into new businesses such as consulting. Last April, it established its NTT Data International Management Consulting subsidiary.

Even if the Japanese economy turns around this year, NTT Data officials don't expect competitive pressures to ease. The company projects revenue will grow a modest 9.4% to ¥432 billion ($3.21 billion) this year, but expects a recovery in net earnings to ¥8.0 billion ($59.48 million). —*Jeff Moad*

Ricoh Co. Ltd.'s IS revenue inched up 1.5% to ¥342.8 billion ($2.55 billion) in the fiscal year ending in March 1992, far off the 31% pace set in the preceding year. The company blames the recession for limiting domestic sales gains to 7.1% and for the 10.9% decline in overseas sales. Overall revenue was up 1.4% to ¥1.02 billion ($7.56 billion), while earnings fell 84.9% to ¥2 billion ($15.2 million).

Though not considered a power in computers, Ricoh claims that computer sales are actually the largest single component of its IS revenue. It sells its own desktop and notebook computers in Japan and assembles PS/55 notebooks for IBM Japan. Copiers, fax machines and other office equipment provide the rest of Ricoh's sales.

The heart of its IS push is in digital imaging technology. "Digital, color and plain paper image-processing peripherals will be the key factors" to the company's growth in the future, a spokesmen contends. One Ricoh hit last year was the IMAGIO MF530 copier, which can be equipped with facsimile, scanner and printer capabilities at the buyer's option. The company intends to start overseas sales "soon."

However, Ricoh typically lags a step behind rival Canon Inc. in new product development, according to Barry Dargan, an analyst with James Capel Pacific Ltd. Its optical filing system and laser printer were late to the market, he notes. The problem seems also to plague Rios Systems Co., a joint venture between Ricoh and IBM Japan, which introduced its first scanner last year.

Ricoh is trying to reverse its laggard ways. R&D spending will grow 5% to ¥58.4 billion ($434 million), while capital spending is being slashed to bolster the company's earnings. However, officials concede that the company will suffer an operating loss this year. "Ricoh doesn't seem to have the products moving through the pipeline to restart growth," notes analyst Dargan.—*Dennis Normile*

Nihon Unisys Ltd.'s share of Japan's mainframe market declined by 0.2 percentage points to 10.1% last year, but revenue increased 4.8% to ¥340 billion ($2.53 billion) in the year through March 1992 as the overall mainframe

market grew. Net profit totaled ¥3.27 billion ($24.3 million), jumping 62% after an extraordinary tax payment the previous year cut earnings. The 6.4% drop in operating income to ¥8.1 billion ($60.2 million) gives a clearer picture of the competitive pressures the firm faces.

Mainframes imported from the U.S. parent, Unisys Corp., account for over 50% of sales. Two new mainframe series were announced and shipped last year—the 2200/900 and the A19. However, the company's long-term prospects aren't in mainframes but in the client/server architecture, software and services.

This year, Nihon Unisys shifted 200 people from mainframe sales to a new department to concentrate on selling UNIX workstations from Sun Microsystems Inc. and Toshiba Corp. and a server from its U.S. parent. It also set up a wholly owned subsidiary, O.S. Engineering Ltd., to focus on sales of UNIX networks bundled with software tailored for specific users.

Nihon Unisys is moving to expand its software businesses—services and software accounts for 37% of revenue, up from 24% in 1990. One particular strength is in computer-aided design software for use on workstations. Last year, Nihon Unisys announced a CAD software/hardware package called Cadcens, based on a joint venture with Toyota Motor Corp. It also announced a banking software package called Triton, aimed at smaller regional banks.

Despite the shift in focus, Japanese IS managers share a lot of uncertainty over the company's future. Unisys dropped previous plans to sell its 32% share in Nihon Unisys, but there are concerns over the health of the parent company. "If Unisys stops making computers," notes a spokesperson, "we won't have much to sell."

Analysts say the company may have some breathing space to develop workstations and servers, because the downsizing trend in Japan is lagging the transition in the United States.

—Dennis Normile

"Last year was awful," says Touru Mori, Oki Electric Industry Co. Ltd.'s general manager of information systems planning: a net loss of ¥488 million ($3.6 million) in the year through March 1992, down from a profit of ¥9.87 billion ($68.1 million) the year before. Total corporate revenue inched up 3.1% to ¥681.3 billion ($5.07 billion). Oki says IS revenue was ¥321.2 billion ($2.39 billion), up 3.7%, and includes sales of printers, data communications gear, automated teller machines, workstations and systems integration services.

Japan's economic slowdown is hitting all IS companies, but Oki's dependence on sales to the beleaguered financial sector is making the pinch particularly painful. Sales of ATMs and on-line transaction processing systems to banks and stock brokerages accounted for around one-third of sales last year, down from 40% in 1990. That shrinkage, Mori says, reflects capital spending cuts by Japan's troubled financial institutions.

One bright spot is printers. Sales were up 13%, due to the strength of new light-emitting diode printers released in both Japan and the United States. Masayuki Makino, a manager in Oki's information communications products group, claims that Oki has gained a point or two of market share in the all-important U.S. printer market.

Another potential Oki strength is high-performance workstations. Oki introduced an engineering workstation to the Japanese market last year and may unveil a workstation based on Hewlett-Packard Co.'s PA-RISC computer architecture this year. Last spring Oki also reached an agreement with HP to develop client/server technology.

New products won't offset Oki's losses, though. Its earnings recovery may have to wait until 1993, when the banking industry is expected to recover. In addition, Kidder, Peabody & Co. Inc. analyst Peter Wolff says Oki is too thinly spread over markets and technologies in which it holds a tenuous position. Its strengths in telecommunications equipment and a few other bright spots aren't enough to sustain a company of Oki's size, he says. "It really needs to be restructured." *—Dennis Normile*

Mitsubishi Electric Corp. is shedding its large-system tradition to tap into the slowly growing Japanese demand for client/server computing.

Domestic barriers to such computing have been high—both language and a lack of PC standards have stood in the way. But Mitsubishi appears to be overcoming these hurdles. In 1991, computer systems revenue grew 10.6% to ¥293 billion ($2.18 billion), in part, analysts say, due to sales of client/server systems.

Last year was the first in which the trend toward downsizing became truly evident in Japan, says Ahira Suzuki, general manager in the strategic planning department of the Information & Communication Systems Group. Suzuki believes that in the future mainframes will be used primarily as large database servers. "So we decided we should move [our] development investments away from mainframes," he says.

The company has done so in several ways. Rather than continuing to man-

ufacture its own systems, Mitsubishi in October became the first company to resell IBM's ES/9000 9121 mainframe, initially running its own proprietary GOS/EA operating system. With the economy slowing, the pace of large-systems sales is dragging, however, and the company has already scaled back its projection that it would sell 120 9121s in three years. It now expects to sell only 90.

The company has also invested in PC and UNIX systems technology from a variety of vendors. In April, it introduced a 486-based server manufactured by Apricot Computers Ltd., the U.K. PC maker Mitsubishi acquired in 1990. It's also reselling smaller Apricot PCs. In May, Mitsubishi signed an agreement to resell Apple Computer Inc. Macintoshes to Japanese corporate users; it projects sales of Apple products will grow to ¥30 billion by fiscal 1994, which ends in March 1995. The two companies are said to be jointly developing multimedia systems.

Mitsubishi resells under its own label reduced instruction set computing (RISC) workstations from Hewlett-Packard Co., along with HP's series 9000 UNIX multiuser systems. The company is said to be looking for a larger UNIX system to augment its midrange UNIX line. According to Suzuki, Mitsubishi would like to use these systems to expand business from its existing manufacturing/industrial base into finance, banking and retail markets. It's planning to work with independent software vendors to develop UNIX-based software for these domestic markets. The company will market the software through a new systems integration unit, called Mitsubishi Information and Communications Systems Engineering Center.

On its own, Mitsubishi is developing a laptop PC, and although it owns only a 3% share of the Japanese PC market, claims it has 10% of the domestic laptop market.

Thanks to the recession, Mitsubishi expects FY 1992 IS revenue growth to slump 1.4% to ¥289 billion. Although company officials project domestic sales will grow 2.2%, they say exports, which make up nearly 23% of IS revenues, will plunge 13.6%.

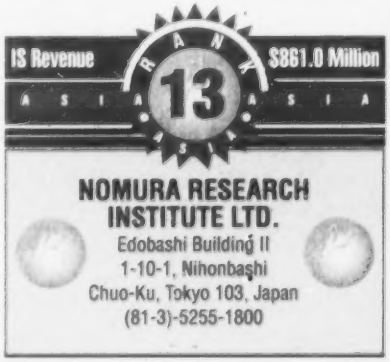
The recession, and particularly a slowdown in audiovisual and semiconductor sales, had already hit corporate revenue, which grew only a slight 0.9% to ¥2.61 trillion ($19.41 billion) in 1991. As a result of heavy investments intended to bolster its sales network, net earnings slid 48.3% to ¥29.5 billion ($219.3 million). Next year's revenue and income will be essentially flat, the company projects, with total revenue growing 0.3% to ¥2.612 trillion and net income declining 1.8% to ¥29.0 billion.—*Elaine L. Appleton, with Jeff Moad in San Francisco and John Rossman in Tokyo*

Faced with a slow market worldwide for computers and peripherals, Seiko Epson Corp.'s IS revenues increased only 0.9% in the fiscal year ending March 1992 to ¥211.5 billion ($1.57 billion). Total corporate revenues also grew at the same snail's pace, rising to ¥470.0 billion ($3.49 billion) for fiscal 1991; net income fell 20% to ¥4.0 billion ($29.7 million). Seiko Epson's management responded by shifting its marketing approach and dramatically cutting expenses, which analysts say will help the company maintain 3 to 4% revenue growth and modest earnings gains.

Sales of printers, Seiko Epson's mainstay IS business, were flat last year at about 55% of IS revenues, according to a company official. About 40% of revenue last year was from personal computers, and Seiko Epson management shifted the company's strategy out of the low-end commodity market and into higher-end products.

For example, the color laptop that Seiko Epson introduced in fiscal 1990 was followed by a notebook version, the PC-386 Book LC. In the desktop market, Seiko Epson introduced the PC-486GR based on Intel's 486 processor, which has a 1,220x750 pixel high-resolution mode as a standard feature and a modular design for CPU upgrading.

Seiko Epson also broadened the company's marketing approach. It recently concluded a venture with Digital Equipment Corp. Japan to jointly market in Japan network systems that connect the companies' personal computers to the DECpc 400 server series. The move toward direct sales of entire systems to corporate users is a major change from Seiko Epson's traditional strategy of selling to individuals through discount stores. Seiko Epson's president, Hideaki Yasukawa explains that "this venture will accelerate the joint development of products that benefit from both companies' strengths and enable us to establish a sound PC-integration business."—*Larry Greenberg*



With nearly 70% of its business from the financial services industry, the remarkable growth of Nomura Research Institute Ltd. halted last

year due to the plunge in Japan's financial markets. DATAMATION estimates NRI's IS revenue fell 4.0% to ¥115.8 billion ($861.0 million). Overall revenue decreased 3.6% to ¥134.6 billion ($1.00 billion). Company officials would not comment on net earnings for fiscal 1991, but did indicate that operating income declined 11.2% to ¥12.4 billion ($92.2 million). In earlier years, NRI had posted annual revenue gains in excess of 25%, as its systems integration and software development services were increasingly in demand by its parent, the securities trading giant Nomura Securities Co. Ltd., as well as other firms.

In response, NRI curtailed its dramatic overseas growth and major capital spending projects, though it did enlarge the Osaka computer center. The difficult business environment forced NRI to develop a more diversified base of customers, particularly in the distribution area, which accounts for 20% of revenues—7-Eleven Japan is a customer.

Also, NRI converted to a more active, proposal-oriented sales strategy, focusing on approaching customers with cost-saving solutions to help them overcome the effects of the recession. NRI expects demand for these services to compensate for the declines in new systems spending, according to Planning Department manager Shunichi Miyoshi.

The System Products Division, established in early 1992, will head NRI's move into the applications downsizing market. This group already offers a database product for handwritten forms that runs on UNIX workstations and will introduce industry-specific, multivendor platform systems for securities and distribution customers before year's end. NRI expects that in-house expertise and user knowledge will give it a competitive edge in developing multivendor systems. For example, in mid-1991, NRI completed the NRI WorkBench system, which links more than 2,000 UNIX workstations and personal computers from a wide range of vendors in a single open system.

—June Hentona

IS Revenue $835.7 Million

RANK ASIA 14

SAMSUNG ELECTRONICS CO.
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Samsung Electronics Co. (SEC) is the bluest of Korea's blue chips—the nation's largest integrated electronics manufacturer and a world force in color monitor production. SEC'S total corporate revenue in 1991 reached W5.23 trillion ($7.13 billion), up 16% over 1990. But like most other Korean PC makers, the company's computer division is apparently sinking deeper in the red.

Sean Goldrick, head of research at James Capel Pacific Ltd.'s Seoul branch, believes only SEC's semiconductor division is turning a profit. The company's other three divisions—consumer electronics, telecommunications and computers—continue to suffer. Together, the four divisions reported a combined operating income of W664.8 billion ($906.7 million) in 1991, up 56%. But due in part to a large debt burden and current high interest rates in Korea, net profit dipped 5% to W68.98 billion ($94.1 million)—about 1.5% of revenue. DATAMATION estimates 1991 IS revenue at W612.8 billion ($835.7 million), up 8.2% from the previous year.

The computer division's profitability "is a very delicate question," concedes Park Joon-Ho, assistant manager for the division's export business department. "With the price competition on international markets, every company is suffering," he says.

Last year, SEC tried to garner additional U.S. market share with its low-cost 80286 Sensor PC. But the attempt failed and alienated some distributors who were cut out by SEC's direct sales strategy for the new PC. Unsold inventories were dumped on the domestic market, contributing to a rapid decline in traditionally high margins at home. As a result, SEC made substantial staff cuts in its PC business.

Another result was a strategic flip-flop in 1992: "We're now focusing on more profit-oriented exports," says Park. With a healthy 8.5% of revenues spent on R&D, SEC is able to produce higher margin products such as a new 486SX desktop PC using "chip-up technology" that, says Park, "lets users interchange CPUs from 33MHz to 60MHz." Earlier this year, the company signed a $20 million contract to manufacture a new pen-based PC for U.S. vendor Grid Systems Corp.

Attempts to make headway in the workstation market have proved frustrating. SEC, which has manufacturing rights for Hewlett-Packard Co.'s HP-PA reduced instruction set computing chip set, has spent more than a year trying to develop a so-called entry-level 40MIPS RISC workstation that could sell for under $10,000. After the delay in product introduction, however, such a price would no longer be competitive. Goldrick attributes the delay in part to SEC's lack of experience in designing and building high-performance systems.

Goldrick says heavy investment in new semiconductor facilities helped pile up additional debt in 1991, eroding cash flow and forcing the company to seek additional debt to finance new business. But SEC is now the world's leading maker of dynamic random access memory, and for all the capital the division soaks up, it also pays off with profits. This strength has helped SEC forge useful relationships. Richard Warmington, HP's representative director at Samsung Hewlett-Packard, which sells HP computers in Korea, says SEC's strength in semiconductors was a major factor in HP's selection of SEC as a business and development partner. *—Geoff Crane*

IS Revenue $830.5 Million

RANK ASIA 15 ASIA

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Sony Corp. probably wouldn't mind putting on a Walkman, turning up the volume and blocking out last year. The combination of economic stagnation in the United States and Europe, a severe slump in the audio-visual market in Japan and a further appreciation of the yen against the major foreign currencies forced the consumer-electronics-giant-turned-entertainment-mogul to register a 44% operating loss to ¥166.2 billion ($1.24 billion). And it didn't help that the Rolling Stones jumped ship to Virgin Music Ltd. in November, taking all of their recordings since 1971 with them.

Still, analysts see evidence of success for Sony's diversification strategy in its positive consolidated profits and revenue for fiscal year 1991, which ended March 1992. Total corporate revenue rose 5.7% to ¥3.82 trillion ($28.4 billion). Net earnings, which included a ¥61.5 billion ($457.2 million) gain on the sale of subsidiary stock, increased 2.7% to ¥120 billion ($893.1 million) from the previous year's level.

Sony doesn't disclose detailed figures on IS revenues, the bulk of which come from workstations and storage devices. DATAMATION estimates IS revenue for fiscal year 1991 at ¥111.7 billion ($830.5 million). Analysts at *Nikkei Computer* estimate that Sony's workstation revenue rose only a few percentage points to ¥52.5 billion ($390.3 million) in fiscal year 1991, while unit sales rose 7.1% to 15,000, a far cry from the double-digit growth recorded in previous years.

The analysts are far more optimistic about next year, however, pointing to an impressive lineup of new NEWS UNIX workstations, based on the 64-bit R4000 reduced instruction set computing (RISC) microprocessor from MIPS Computer Systems Inc. New boxes include the NWS-5000 desktop machine and NWS-5900 server, which Sony officials claim will run as fast as 100 million instructions per second, as well as the 37MIPS NWS-3150 laptop. Sony is also preparing a Japanese-language version of Novell Inc.'s NetWare For UNIX, which will be sold under the title NetWare For NEWS and will enable the NEWS workstations to function as a local area network server on Novell nets. Sources believe these new machines will boost sales back into the double digits in fiscal year 1992, predicting that sales could grow by as much as 27% to 19,000 units.

In the U.S. market, Sony is deepening its ties with Apple Computer Inc., which has linked the Macintosh with Sony's Palmtop. Sony drew rave reviews for manufacturing Apple's PowerBook last year and attracted attention by porting AppleTalk to the NEWS workstation, so the servers could be used in Macintosh networks. Earlier this year, Sony acquired about 5% of Apple affiliate General Magic Inc. to codevelop consumer electronic products. Sony is also working with Apple and Motorola Inc. to release multimedia PCs in 1993, and has been invited by the Apple-IBM joint venture Kaleida to jointly develop a multimedia data format.

In the fall, Sony is expected to begin selling a DOS-compatible portable player in the United States based on CD-ROM XA technology developed in conjunction with Microsoft Corp. "The player combines the benefits of CD-ROM as a computer peripheral with the freedom of a personal information device," says Mark Frankel, vice president of the Personal Information Products Division for Sony Corp. of America. Sony will use Microsoft's Viewer application as the recommended development tool for the player, dubbed the Bookman. Meanwhile, it is hoping to phase out the ubiquitous Walkman tape player in favor of the more expensive Data Discman—a music machine that uses nonstandard 2.5-inch CDs but can be used as a mass storage device for multimedia and portable computers. The hope is, of course, that revenues generated from these initiatives will be financial music to Sony's corporate ears.

—June Hentona

IS Revenue $814.9 Million

RANK ASIA 16 ASIA

ACER INC.

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America is Acer Inc.'s soft spot—in more ways than one. The Taiwanese PC maker, which has profitable divisions almost all over the globe, has wanted to make a dent in the huge American market for personal computers. But, after three years of an aggressive expansion strategy, including an unusual and expensive marketing push to create a name-brand identity in North America, Acer found its soft spot was spoiling fast.

In 1991, Acer America Corp. lost over $20 million on revenue of $472 million—the only Acer division to lose money. And despite steady revenue growth this year—corporate IS revenue grew 8.5% to $814.9 million, and total corporate revenue climbed 3.8% to $985.2 million—the parent company's earnings have been declining over the last three years. Costs associated with a furious spate of product introductions have taken their toll on the bottom line. An acquisition spree also contributed to its earnings erosion.

After Acer's years of shaky earnings, Acer America's loss was the proverbial straw that broke the

camel's back, causing the company's first-ever total corporate loss of $22.7 million. That prompted Acer America president Leonard Liu to walk out the door in April 1992. Acer founder and chairman Stan Shih took over as group president and chairman of Acer America.

The company is attempting to reverse its fortunes, in part by continuing the new-product blitz it began last year. Simultaneously, it's paring personnel in an attempt to bolster revenue per employee, which at year's end sagged at $188,880.

Still, a number of highlights suggest that the past year may have strengthened the company. Acer fulfilled the promise of last year's research and development efforts with a batch of high-end products that included multiuser UNIX systems, based on Intel Corp.'s 80486SX chip, as well as 386 and 486SX-based PC's. Shih hopes the new high-end systems, targeted particularly at North American users, will set Acer Inc. apart from other clone makers.

Acer has spent the last two years setting up an international service and support network, which it needs in order to compete for multinational corporate customers. In fact, chairman Shih believes that it's crucial Acer become a truly global player: "Unless we take action now, the future tides will turn against Acer," he says. Acer has increased its market share by 80% in the Third World and in some parts of Europe. And it has revamped its manufacturing process; in an effort to speed deliveries, it's planning to ship parts, instead of complete systems, from Taiwan to Acer America in San Jose.

With these changes in place, Shih expects total corporate revenue to grow 11% this year to U.S. $1.1 billion and to break even once again by year's end. But the uncertain economy has foiled more experienced companies than Shih's, and only time will tell.

—Kimberly Mantel with Carol Wei in Taipei

IS Revenue — RANK 17 — $667.3 Million

ASIA ASIA

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Tatung Co. capitalized on its strength in mass production last year. While many Taiwanese computer firms sank into the red, Tatung, which manufactures electric fans, televisions and picture tubes in addition to monitors, mice and personal computers, grew its IS revenues 12.2% to NT$17.72 billion ($667.3 million). Perhaps more surprising in this era of depressed earnings, Tatung's net income increased 65% to NT$483 million ($18.2 million).

Until last year, at least 60% of the firm's IS revenues came from IBM, which resells Tatung monitors under its own label. With an eye on IBM's slipping fortunes, however, Tatung began to reduce its dependence on Big Blue. In early 1991, the company won an order from Packard Bell Electronics Inc. for deliveries of more than 100,000 PC's per month, which Packard Bell resells under its own name. Industry sources attributed Tatung's revenue growth to the Packard Bell order, and also say such volume manufacturing allowed Tatung to reduce manufacturing costs, contributing to its extraordinary profit increase.

Behind its solid growth, however, lie some hidden problems. A powerful, centralized management team keeps an unyielding grip on production costs and has created a successful business as a supplier to original equipment manufacturers (OEMs). But, industry insiders say that same authoritarian management structure has hamstrung development staff and hampered marketing creativity; for example, top management monitors all expenditures greater than $2,000. As a result, Tatung's own products are perceived to lack innovation and, consequently, have little brand recognition. Less than 5% of its revenues come from own-brand sales.

Tatung president W.S. Lin believes that "new products and new [distribution] channels can solve most of the problems." Lin is determined to grow Tatung's name-brand business to equal its OEM sales. To do so, he believes the company can develop new products and buy American, Asian and European distribution channels to augment its own channels.

Among the products it hopes to introduce in 1993 are palmtops, pen-based systems and liquid crystal display (LCD) screens.

By importing advanced technologies and forming development partnerships, Tatung hopes to become Taiwan's leading supplier. Currently, Tatung is attempting to develop a next-generation Sun-compatible workstation. It's ready to back a 10-year development effort, says Lin. "Not every company has the resources for this," he says. *—Carol Wei*

IS Revenue — RANK 18 — $650.9 Million

ASIA ASIA

CSK CORP.
Shinjuku Sumitomo Building
2-6-1 Nishi-Shinjuku,
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(81-3)-3344-1811

CSK Corp. stands at the center of a group of more than 25 companies that provide software, network services, systems integration, database services and other information services. Although there is no official holding company for this group, CSK prepares a consolidated financial statement including the results of 21 subsidiaries. In addition, CSK owns part of 16 nonconsolidated subsidiaries and 19 affiliates, such as

SEGA Enterprises Ltd., Japan's largest manufacturer of game software and amusement machines.

Due to its varied customer base—IS revenues are derived from financial, manufacturing, processing, distribution and service sectors—CSK weathered the Japanese recession fairly well last year. DATAMATION estimates IS revenue was up 14.7% to ¥87.5 billion ($650.9 million) in fiscal year 1991 (ending Sept. 20). Computer services revenue, which includes programming and software development, facilities management and other services, jumped 16.7% to ¥72.9 billion ($542.3 million), while hardware revenue was flat at ¥14.6 billion ($108.6 million). Corporate officials add that CSK's IS revenue growth was also due to its strength in the emerging market for downsizing applications and converting MIS shops to open system environments. CSK's overall consolidated sales grew more than 12.3% to ¥90.1 ($669.6 million) and net income rose 9.4% to ¥5.2 billion ($38.7 million).

CSK will enhance its outsourcing capabilities to take advantage of that MIS trend, but the company's priority will be on "in-source resource management and consulting"—CSK system engineers providing guidance to MIS directors, rather than outright purchase of facilities, explains Junkyo Fujieda, senior managing director of CSK.

CSK expects to be hit harder by the struggling Japanese economy in the current fiscal year, according to a corporate forecast issued earlier this year. Total revenues are expected to increase only 5%, with computer service revenues rising 11% and hardware sales dropping 14%. "The steady decline in CSK's hardware sales is the result of a conscious effort to shift that business to CSI," according to Fujieda, who is also president of Computer Systems Integration Corp. Ltd., a joint venture with IBM Japan formed in 1989 to sell IBM PCs and minicomputers.

—John Rossman

INTEC INC.
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Intec Inc. outshone its systems integration rivals last year by maintaining solid double-digit growth even as Japan's "bubble economy" burst. IS in the last fiscal year rose 16.3% to ¥67.8 billion ($504.2 million). Having helped initiate the data-processing industry in Japan in the 1960s, Intec, which in 1982 became Japan's first privately owned value-added network (VAN) service provider, has long been one of Japan's leading IS businesses.

Intec's success is due to its pioneering activities as a nationwide VAN service provider—in January it became only the second company after Nippon Telegraph and Telephone Corp. to offer a domestic integrated services digital network. With revenue up 30% from 1990, Intec's enhanced telecommunication services are its fastest growing business. While they account for only 15% of annual sales, enhanced telecom services give Intec unique prestige and enable it to more successfully pursue its other three lines of business: software development, turnkey systems and data processing. "It's difficult to make telecommunications a profitable business but it's a very good sales tool," explains Ken Segawa, executive director of Lehman Brothers Japan.

About 90% of Intec's software business, which grew 16.8% to ¥26.18 billion ($194.7 million), is in applications, ranging from games to artificial intelligence to forecasting packages. Systems integration activities include a number of ¥1 billion orders like a recently delivered accounting system for a life insurance company, as well as a rapidly growing number of smaller orders, many of which involve workstations and networking.

In April, Intec reorganized to better coordinate its four traditionally independent businesses, especially in relation to its systems integration and multimedia plans. "We are trying to integrate technology and people so that we can handle bigger projects," notes Hisatake Jimpachi, manager of Intec's Management Administration Department. The company's first multimedia products, including compact disc interactive (CDI) systems, are expected soon.

—Michael Galbraith

C. ITOH TECHNO-SCIENCE CO. LTD.
16-7, Komazawa 1-Chome
Setagaya-Ku, Tokyo 154, Japan
(81-3)-3419-9000

C. Itoh Techno-Science Co. Ltd., the principal IS operation of Japan's leading trading house, C. Itoh & Co. Ltd., is best known as the leading reseller of Sun workstations—70% of the total sales at CTC are Sun-related hardware and software.

CTC weathered the general economic downturn in Japan rather well—it boosted IS revenue 8% in the fiscal year that ended March 31 to more than ¥65 billion ($484.8 million). CTC profited from Sun Microsystems Inc.'s strengths in downsizing mainframe-based applications, networking, open systems and multimedia. CTC also resells hardware from Motorola Inc. and fault-tolerant systems from Stratus Computer Inc.; its Stratus sales posted 30% growth.

CTC sees itself as a system integrator that focuses on applications for scientific and engineering purposes. "As a trading company we can handle any make of hardware, and we have the best information-gathering network," claims a company official. Like the hardware, nearly all the applications were made by others, but CTC has developed in house

one computer-aided design application that has been a major success—more than 1,600 units have been sold since 1988. Factory automation remains the primary source of revenue for CTC—65% last year, five percentage points less than in 1990, due to faster growth in the office automation sector.

CTC's most significant development recently was the introduction in February of UNIX-based servers from Fujitsu Ltd.'s United Kingdom-based subsidiary ICL PLC. In the short term, the server is viewed as a hot product in the office automation market, according to analysts. It is also one of the reasons the company is expecting sales to rise a sharp 15% this year. —*Michael Galbraith*

Times are tough for Alps Electric Co. Ltd., and only part of the problem is the weak economy in Japan and the West. Known as a high-volume maker of floppy-disk drives and electronic components, Alps was simultaneously slammed by the worldwide recession and sharp competition.

"Many Alps products are facing severe competition from other Far East Asian companies," notes analyst Kimi Takano of Goldman, Sachs Japan. DATAMATION estimates that in the fiscal year ending March 1992 the consolidated IS-related sales of the Alps Group took a downward turn of about 4.5% to around ¥53 billion ($394.1 million).

"There were no real bright spots in our IS-related business" during the last fiscal year, concedes a company spokesman.

Like many Japanese companies, Alps shifted its focus from increasing sales to increasing profits. "Alps is trying to move from the single-component business to the more value-added module business," explains Takatoshi Yamamoto, an executive director at the investment banking firm Morgan Stanley Japan. Typical of its aspirations is liquid crystal display (LCD) components, though Alps is a relative latecomer. Financial analysts doubt that Alps can succeed in the high value-added end of the market, such as thin film transistor LCDs for color laptop computers. The huge investment necessary and the severity of the competition from companies such as market leaders Sharp Corp. and Toshiba Corp. present huge obstacles for Alps.

Alps is expected to have more luck revising its business model by seeking orders for modified versions of its existing products. It is introducing more computerized assembly and flexible manufacturing to shift from mass-produced orders toward smaller, more customized orders. "It is too early to judge the results of the company's restructuring," says Morgan Stanley's Yamamoto.

This year, Alps's revenue and profits are expected to decline due to the Japanese recession and intense competition, but there are brighter spots in its IS business. Orders for hard-disk drives have shown especially dramatic growth, up almost 100% over last year, according to the company. —*Michael Galbraith*

As the Taiwanese market grows more competitive, so too does The Mitac Group. The company, which manufactures and sells personal computers, software and services in addition to semiconductors, reported total corporate revenue growth in 1991 of 22.7% to $540 million. But earnings fell a precipitous 91% to $2 million, as the previously conservative group invested heavily in an unusually aggressive global expansion, both broadening distribution channels and bringing new products to market. The recession, which forced PC prices down, also gnawed away at the company's margins.

In fact, IS revenue declined 5.2% to $373.6 million. The group's PC manufacturer, Mitac International Corp., lost $2.9 million on revenue that grew 25% to $235 million. The group's Mitac Inc. systems integration and service supplier made up the bulk of the group's IS revenue with $138.6 million. In general, the need for services is growing, and Mitac Inc.'s earnings fared somewhat better. The group doesn't disclose Mitac Inc.'s earnings, however, and says only that Mitac Inc. and MSI International Corp., the group's semiconductor manufacturer, together earned a profit of $4.9 million.

Mitac International last year established new business units that market portable computers and PC monitors. New products in both categories were responsible for the 25% sales increase, but associated research and development spending, along with investments in the new distribution channels, caused the loss. By the end of 1992, the company plans to produce 80,000 monitors a month, to be distributed through Mitac's U.S. and European branches to local distributors and dealers. It also plans to expand the current two-product portable PC line to six products, including a handheld system. "We aim at becoming a strong portable system supplier that competes against Japanese consortiums," says Mitac Group president C.S. Ho.

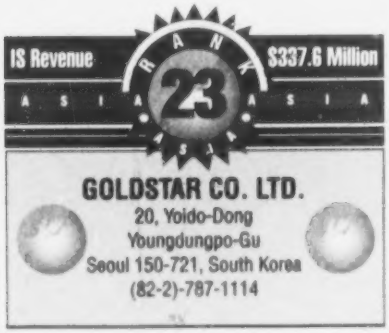
Among new distribution channels is Compac Microelectronics, a $160 million PC distributor in Fremont, Calif., which the group acquired for $8 million. Mitac will use Compac to develop brand-name sales in the United States. "Our emphasis [for branded products] has been Europe," says Ho. "This year, we turn toward the U.S. market." The group is negotiating more acquisitions and strategic alliances in both the States and Japan.

Despite its desire to build U.S. brand-name sales, Mitac plans a conservative marketing strategy compared with Taiwanese leader Acer Inc. "We go step by step with foot soldiers instead of overall bombing" via expensive advertisements to develop brand awareness, says Ho.

As it acquires global distribution channels, the company is also restructuring its manufacturing process. Formerly, Mitac built most systems in Taiwan but is moving toward "pipeline management"—buying components and building systems locally. In July 1992, it was expected to finish construction of an assembly line in the United States for products destined for North and Latin America. Another plant in Britain will produce products destined for Europe.

To increase European sales, Mitac this year opened Belgian, French and Spanish branches, in addition to maintaining existing branches in Britain and Germany. President Ho, who says Taiwanese companies have largely neglected the fruitful Japanese market, is currently negotiating strategic alliances with Japanese importers and chain store owners.

Ho expects Mitac's efforts to bear fruit only after a bitter battle in the year ahead, during which he expects weaker worldwide suppliers to disappear as they suffer the effects of recession. —*Carol Wei*



On June 1, 1992, after a very difficult year, Goldstar Co. Ltd., the electronics flagship of South Korea's giant Lucky Goldstar Group, merged with affiliate Goldstar Electronic Devices Co., a $111 million maker of electronics parts for computer products.

It was the latest corporate reshuffle in years of organizational changes intended to bolster Goldstar Co.'s health. During the last fiscal year, Goldstar Co.'s revenue grew 23.3% to W3.68 trillion ($5.02 billion). But net profit plunged 44% to W19 billion ($25.9 million), just 0.5% of revenue. IS systems and services accounted for less than a tenth of sales; DATAMATION estimates last year's IS revenue grew 21.8% to W247.5 billion ($337.6 million). The remainder of revenue came from the company's increasingly unprofitable consumer electronics division. Opinions are divided as to whether the merger will help salvage the company that kicked off Korea's electronics industry in 1957.

"In the long term, [the merger] will be good for Goldstar," reckons Keith Nam, a Jardine Fleming Securities Ltd. analyst stationed in Seoul. About 90% of the electronics parts manufactured by Goldstar Electronic Devices go into Goldstar Co.'s personal computers, monitors, workstations and peripherals.

But another securities analyst in Seoul says the move reflects the confusion that has plagued attempts to reorganize the group's electronics business since the mid-1980s. "They still have a lot of overlapping lines," says the analyst, who asked not to be identified. "They have a lot of inventory and a lot of receivables hanging around."

Goldstar Co.'s barely floating balance sheet is buoyed by artificial profits from transactions with affiliates, according to the analyst. The analyst says Goldstar Co. forces many of its subsidiaries, most of which are operating at a loss, to supply parts below cost so the parent company can show a profit. An additional hidden drag on the company's cash flow is its 64% equity interest in debt-ridden Goldstar Electron, the semiconductor affiliate launched in 1989.

Despite its struggles, Goldstar Co. still ranks among Korea's top five PC makers in overseas as well as domestic sales. And the company is Korea's largest distributor of Sun Microsystems Inc. workstations. But efforts to develop its own line of Sun clones have met with limited success. Part of the reason may be a lack of cash for R&D. Company spokesmen say Goldstar invested 5.8% of revenue into R&D in 1991, significantly less than archrival Samsung Electronics Co. But in June, in simultaneous efforts to reduce R&D costs and increase competitiveness overseas, the two companies signed an agreement to share—without cost—some 8,000 patents previously held separately. —*Geoff Crane*

As the saying goes, reports of TriGem Computer Inc.'s death have been greatly exaggerated.

TriGem Computer, South Korea's largest independent maker of PCs, workstations and peripherals, bounced back in 1991 with a 45% surge in revenue to W233.5 billion ($318.5 million), following a 23% drop in revenue the year before.

But a $30 million bond issue for production of the industry's first battery-powered SPARC laptop, and bank loans for a new PC factory, doubled TriGem's traditionally low debt-to-equity ratio to 207%, driving net income down 70% to a meager W2.4 billion ($3.3 million). And extremely slow sales for a SPARC-based laptop workstation introduced last year—with much fanfare—proved a public relations nightmare for TriGem and for its U.S. development partner, RDI Computer Corp., a start-up in which TriGem holds a 10% equity stake. The combination of these three factors

started rumors flying that TriGem was on the verge of going under.

Those rumors turned out to be false. In fact, during the first quarter of 1992, a booming domestic market helped push PC revenues up another 56% and total revenue up 40% on a year-to-year basis. And the SPARC laptop, for which there is no domestic market, is beginning to show signs of life abroad, says Kim Do-Jin, TriGem's executive director of corporate planning.

Moreover, former Sun Microsystems Corp. executive Roy Wright took over the top spot at RDI in June, suggesting that a deal with Sun for SPARC laptops is in the works. Sources speculate that under such an agreement, TriGem would manufacture upgraded notebook SPARC systems for Sun, and Sun would sell them through its network of value-added-resellers.

In 1991, TriGem also invested $850,000 in a marketing joint venture with CMS Enhancements Inc. The joint venture, CMS/TriGem Computer Corp., will sell TriGem's line of 386DX/SX and 486 PCs in the United States.

To brighten its balance sheet, TriGem spun off four unprofitable divisions into separate affiliates in January 1992. In June 1992, the company added two teams that will sell so-called "personal solutions" and "network solutions" designed to take advantage of the nascent Korean market for computer networking. "In the U.S., 90% of the PCs are connected somehow," says Kim. "But in Korea, it's less than 10%. We want to follow that trend in network solutions as a value-added area." —*Geoff Crane*

IS Revenue RANK 25 $298.6 Million
ASIA ASIA

OMRON CORP.
Karasuma Nanajo
Shimogyo-Ku
Kyoto 600, Japan
(81-75)-344-7000

Like many other Japanese companies, Omron Corp.'s main objective for fiscal 1991 was to maintain sales at the same level as in the previous year. And, in fact, overall corporate revenue increased a modest 4% to ¥483.25 million ($3.59 billion), but net income plummeted 71%, to ¥6.17 billion ($45.9 million). And DATAMATION estimates IS revenue declined 4.8% to ¥40.17 billion ($298.6 million), mainly due to reduced investment spending throughout the Japanese economy. Akio Imaizumi, director and executive general manager of Omron's Office Automation Division, projects an 18% gain in IS revenue for fiscal 1992.

One of Omron's largest sources of IS revenue last year—¥19.65 billion ($146.1 million)—came from reselling a wide range of equipment from NEC Corp. and Toshiba Corp. through its Omron Micom Systems Corp. subsidiary. Omron's peripherals business brought in another ¥14.32 billion ($106.5 million), according to Imaizumi. The company also recorded ¥3.91 billion ($29.1 million) from its Luna workstations, which are based on Motorola microprocessors.

Workstation results were disappointing last year, down 5% from the previous year's level, despite the introduction of various new models and software applications. Unofficial forecasts early in the year had predicted that workstation revenue would rise 30 to 40%. Omron plans to revive workstation sales by making better use of the Japanese distribution network of its recently acquired Nippon Data General subsidiary, by strengthening its application software platform strategy and by focusing sales efforts on factory and office automation. As a result, Omron expects workstation revenue to increase 34% in the current fiscal year. Analysts at *Nikkei Computer* are more cautious, noting that the forecast relies on a strong economic recovery. New additions to the Luna series last year include the Luna 88K Plus, which achieves top processing speeds of 147 million instructions per second running on a 33-megahertz clock, and a new operating system based on the fuzzy logic form of artificial intelligence.

—*John Rossman*

The DATAMATION Asian 25

For more information on the DATAMATION Asian 25 companies, circle the appropriate numbers on the Reader Card.

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Happy Days With Uncle Sam

Government workers may keep their jobs, but they'll need to stretch their IT-purchasing dollars.

Big government has started getting even bigger once again. The number of civilian government workers fell for three straight months in 1991, but beginning with August of last year, government employment slowly expanded. In April 1992, almost 18.9 million people—more than ever before—received paychecks from federal, state or local authorities.

But while personnel grew, government purchases diminished. After inflation is taken into account, government agencies bought an annualized $930 billion worth of goods in the first quarter of this year, down 1.5% from last year. Cahners Economics expects dwindling purchases through 1994 as Uncle Sam tries to rein in its enormous debt.

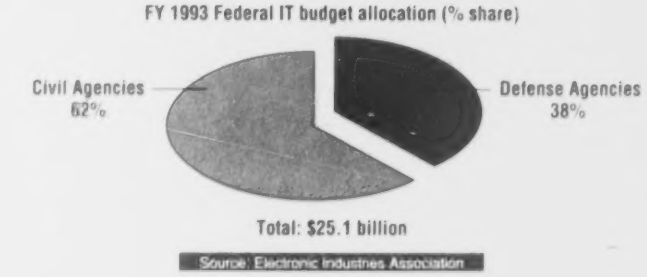
The Electronic Industries Association (EIA) estimates that the federal information systems budget will see little growth, about 0.2% annually, adjusted for inflation, for fiscal year 1992 through fiscal year 1997. Employees of the Department of Defense should prepare themselves for 3% annual declines in real terms, as the agency copes with budget constraints.

On the civilian government IT front, the EIA expects the $15.6 billion budget to climb 2.1% annually in real terms through 1997. The heightened emphasis on law enforcement and transportation safety means that some initiatives, such as the National Crime Information Center project, valued at $77 million, and the Department of Transportation's Intelligent Vehicle Highway System, will push forward. ■

By Madeline Franchi, Cahners Economics. For more information on Cahners Economics's forecasting services, contact Dan Buchan at (617)-630-2105.

People Up, Purchasing Down

Source: U.S. Department of Labor



Source: Electronic Industries Association

The Economy At A Glance

U.S. Economy: Macroeconomic And Industrial Indicators

	Actual Q4/91	Actual Q1/92	Actual 1992	Forecast 1993	Forecast 1994
Gross Domestic Product	0.4	2.4	2.0	2.6	2.0
Business Investment In Equipment	-1.6	3.7	2.1	4.6	4.2
Government Spending	-5.4	3.1	-2.3	-3.7	-0.1
Consumer Spending	0.0	5.4	2.6	2.8	1.9
Exports	9.7	-0.9	5.6	7.8	6.5
Imports	2.1	-0.2	4.7	3.6	3.2

All calculations are % change in 1987 dollars; quarterly figures are seasonally adjusted annual rates

	April 1992	March 1992	% Change 4/92-3/92	April 1991	% Change 1991-1992
Manufacturing Production (1)					
Process Industries Total	109.6	109.1	0.5	103.5	6.0
Chemicals	115.2	114.6	0.5	109.0	5.7
Petroleum	109.8	109.0	0.7	105.7	-3.9
OEM Total	109.7	108.9	0.7	108.6	0.9
Computers & Peripherals	167.1	164.9	1.3	155.6	7.4
Communication Equipment	112.2	110.3	1.7	111.3	0.8
Transportation Equipment	97.9	96.5	1.5	97.2	0.7
Services Employment (2)					
Finance, Insurance, Real Estate	6.654	6.634	0.3	6.689	-0.5
Health Care	8.394	8.379	0.2	8.131	3.2
Computer & Data Processing	810	811	-0.1	788	2.8
Transportation/Utilities	5.705	5.688	0.3	5.780	-1.3
Retail Trade	18.907	18.691	1.2	19.092	-1.0
Wholesale Trade	5.968	5.949	0.3	6.066	-1.6
Government	18.899	18.882	0.1	18.707	1.0

(1) Index 1987 = 100, seasonally adjusted
(2) Millions of persons, not seasonally adjusted

Source: Commerce Dept. and Cahners Economics

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